



<b>ALPINA</b>	Burkard Bovensiepen GmbH+Co. Alpenstraße 35-37, D-86807 Buchloe	Dwg.-Nr. 88 03 175	Page 1 of 25
	Service Manual BMW/ALPINA D10 BITURBO	Prepared by Engineering	Date 20 July 2000

# Service Manual

## BMW / ALPINA D10 Biturbo



**The servicing covered herein should be undertaken by qualified mechanics only.**

This manual has been based on the service manual for the BMW 530d.

All torque specifications are listed in the service manual for the BMW 530d.



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**Checking the swirl flaps for proper operation**



The swirl flaps are actuated by the linkage (1) whenever the vehicle's engine is started, shut off, or reaches approximately 2.200 rpm.



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**Removing and reinstalling, sealing, or replacing  
the exhaust manifolds**



**Warning!**

Burn hazards!

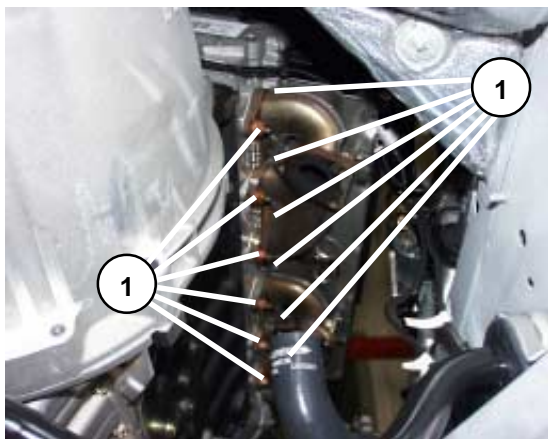
Do not attempt any of the following servicing operations until the vehicle's engine has cooled down.

**Caution!**

Installing charge-air hoses that are not perfectly dry and free of grease can cause a failure of the charge-air system.

Make certain that the charge-air hoses are perfectly dry and free of grease before reinstalling them.

Refer to p. 5 of this manual for instructions on removing and reinstalling the exhaust-gas turbochargers.



Remove the nuts (1) holding the exhaust manifolds in place and remove both exhaust manifolds.

**Reinstalling the exhaust manifolds:**

- Use all new gaskets and seals.
- Coat the threads on the manifold studs with a thin layer of copper paste (CRC), which is available from BMW's parts department.
- Replace the nuts (1) with new nuts.
- Torque the nuts down, working from the centers of the exhaust manifolds toward their outer ends.



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**Removing and reinstalling / replacing the exhaust-gas turbochargers**



**Warning!**

Burn hazards!

Do not attempt any of the following servicing operations until the vehicle's engine has cooled down.

**Caution!**

Installing charge-air hoses that are not perfectly dry and free of grease can cause a failure of the charge-air system.

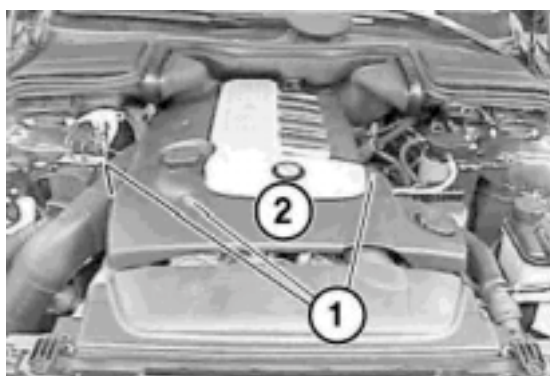
Make certain that the charge-air hoses are perfectly dry and free of grease before reinstalling them.

Refer to p. 24 of this manual for instructions on removing and reinstalling the precatlysts.

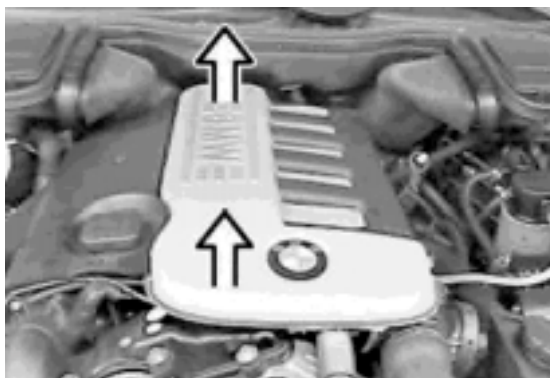
Drain approximately 3 liters of motor oil from the crankcase.

Remove the fan cowl.

Refer to Dwg. No. 17 11 031 for instructions on removing and reinstalling the fan cowl.



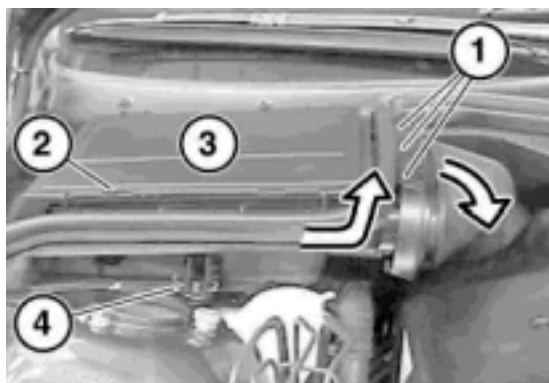
Remove the screws (1) holding the silencer shroud (2) in place and slide the silencer shroud forward.



Lift off the silencer shroud.



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Release the clips (1) and withdraw the air duct, as shown by the arrow.

Release the clamping bail (2).

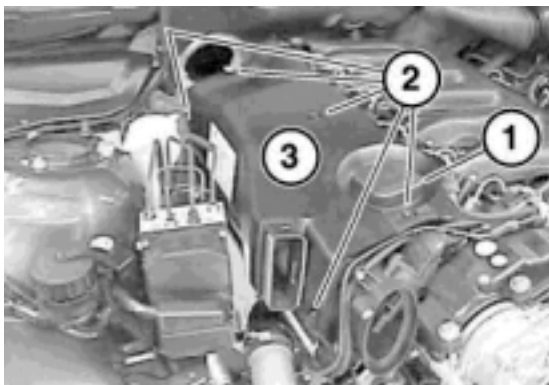
Remove the cover (3) from the microfilter housing.

Open the clamp (4).

Rotate the microfilter housing in the direction of the arrow and withdraw it upward.



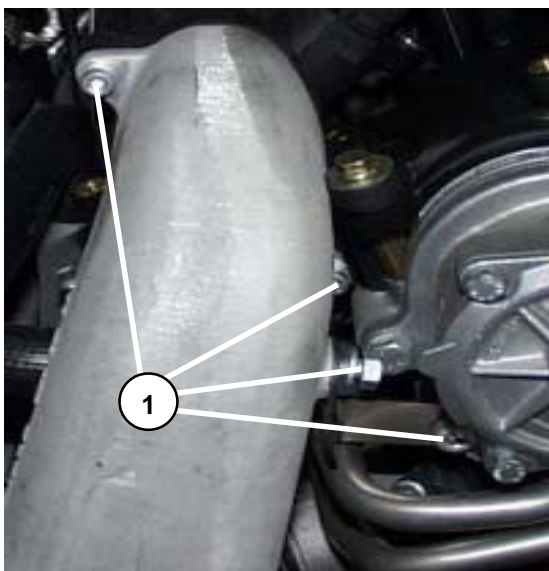
Remove the intake duct assembly (1).



Remove the cap (1).

Remove the screws (2) holding the air-filter cover (3) in place.

Lift off the air-filter cover (3).

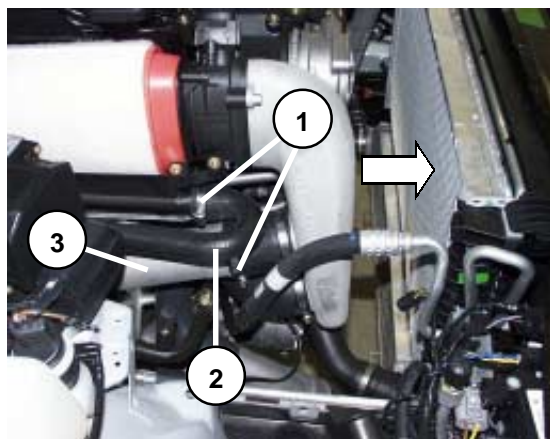


Remove the airduct mounting bolts (1).

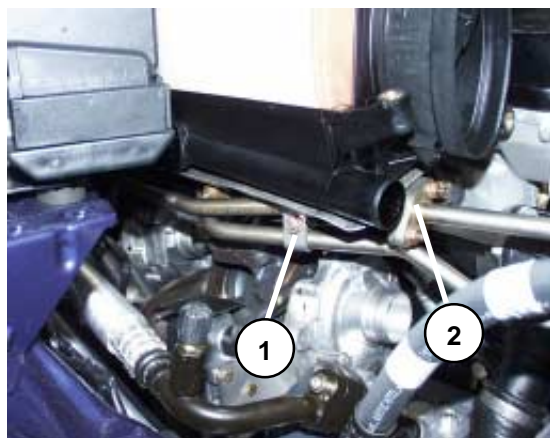




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Loosen the clamps (1) on the molded hoses.  
Remove the crankcase-ventilation hose (2).  
Remove the distributor on the air-intake duct complete with the intake duct for Turbocharger 1 by pulling it forward.  
Remove the intake duct (3) for Turbocharger 2.



Remove the clamp (1).  
Remove the fittings fastening the EGR-lines to the rear exhaust manifold and the nuts on the flange (2).  
Remove the rear EGR-line.

Remove the fitting fastening the EGR-line to the front exhaust manifold.



**Vehicles equipped with manual transmissions only:**

Remove the bolt and nut (1) holding the fitting in place.  
Loosen the clamp (2) and remove the front EGR-line.

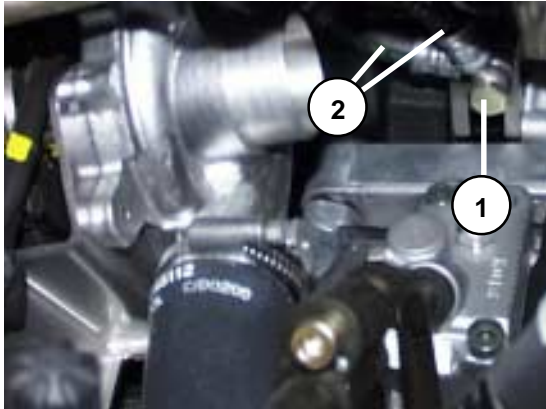


**Vehicles equipped with automatic transmissions only:**

Loosen the clamp (1) and remove the front EGR-line.



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Unscrew the hollow bolt (1).  
Remove the oil lines (2).

**Note:**

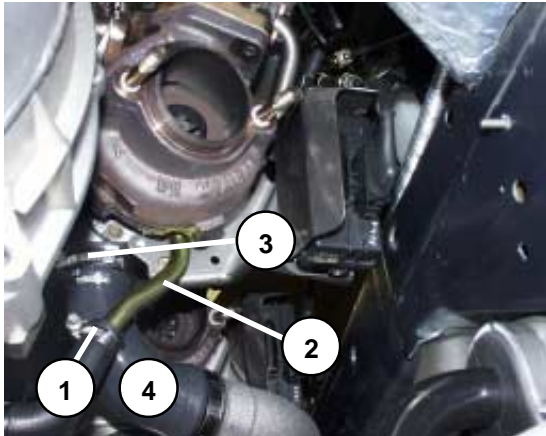
Seal the fittings for the oil lines and the openings in the crankcase housing using suitable caps or plugs.

**Note on reinstallation:**

New seals are to be used when reinstalling components.



Loosen the clamp (1) on the hose (2) on the front turbocharger's exit port and remove the hose (2).



Loosen the clamp (1) on the oil-return hose and remove the oil-return hose.

Unscrew the oil-return tube (2) on the turbocharger.

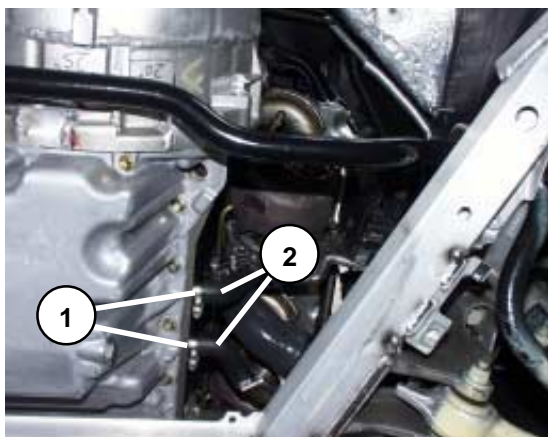
Loosen the clamp (3) on the hose (4) on the rear turbocharger's exit port and remove the hose (4).

Remove the tube on the intercooler intake port and move it aside.

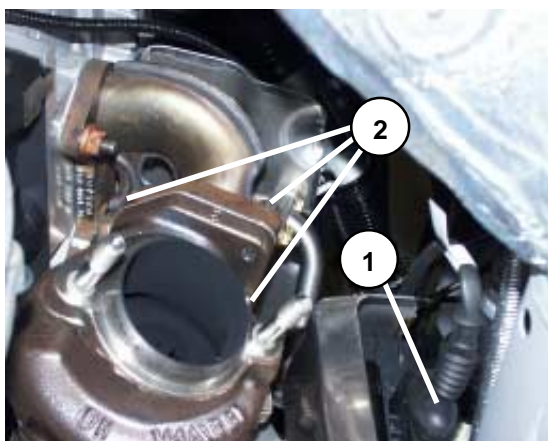




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Loosen the clamps (1).  
Remove both hoses (2).



Unplug the connector (1).  
Unscrew the three bolts (2) holding each turbocharger  
in place and withdraw both turbochargers from below.

**Installing / reinstalling turbochargers:**

- When fitting new turbochargers, the condition of the oil supply and return lines should be taken into consideration.
- Replace all gaskets and seals with new ones.
- Clean mating surfaces on the exhaust manifolds before reinstalling them.
- Replace the seals on the turbochargers.
- Refill the crankcase with motor oil.

Test drive the vehicle.  
Check the oil level in the engine crankcase.  
Check all lines and joints for leaks.



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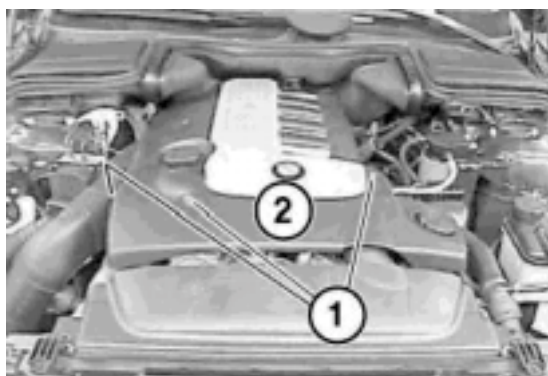
**Removing and reinstalling / replacing the exhaust-gas-recirculation (EGR) lines**



**Warning!**

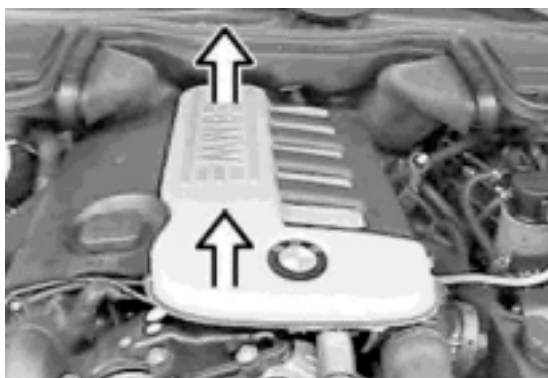
Burn hazards!

Do not attempt any of the following servicing operations until the vehicle's engine has cooled down.

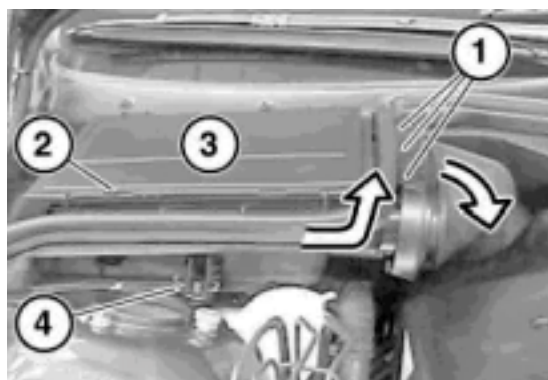


Remove the screws (1) holding the silencer shroud (2) in place and slide the silencer shroud forward.

Refer to Dwg. No. 17 11 031 for instructions on removing and reinstalling the fan cowl.



Lift off the silencer shroud.



Release the clips (1) and withdraw the air duct, as shown by the arrow.

Release the clamping bail (2).

Remove the cover (3) from the microfilter housing.

Open the clamp (4).

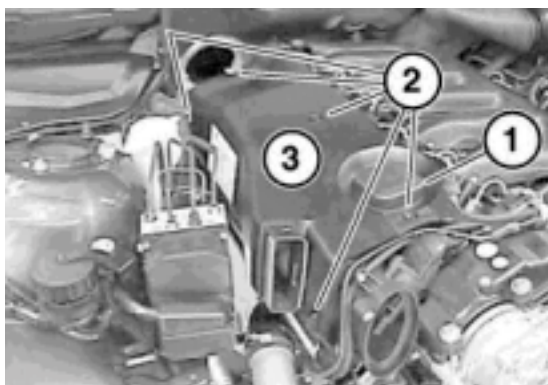
Rotate the microfilter housing in the direction of the arrow and withdraw it upward.



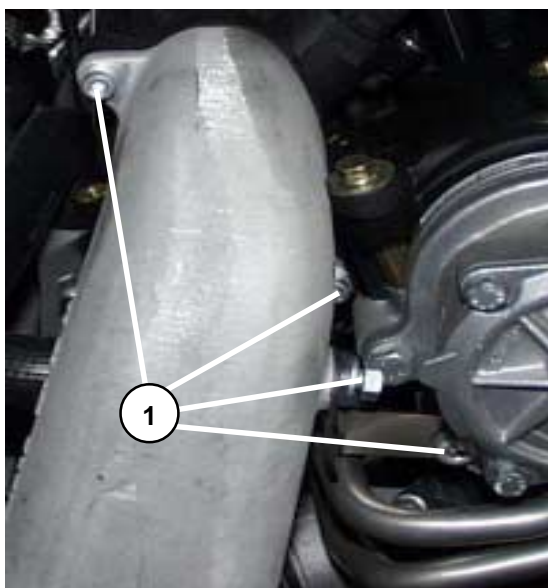
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Remove the intake duct assembly (1).



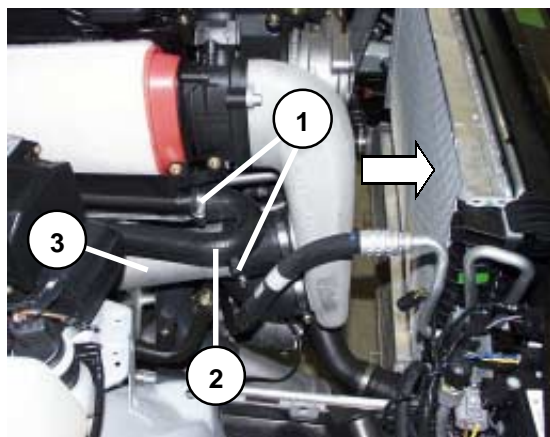
Remove the cap (1).  
Remove the screws (2) holding the air-filter cover (3) in place.  
Lift off the air-filter cover (3).



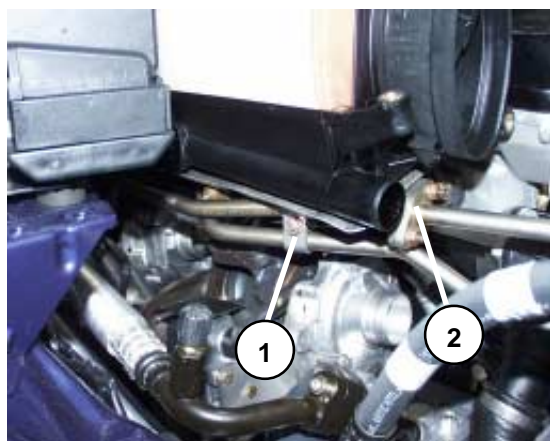
Remove the airduct mounting bolts (1).



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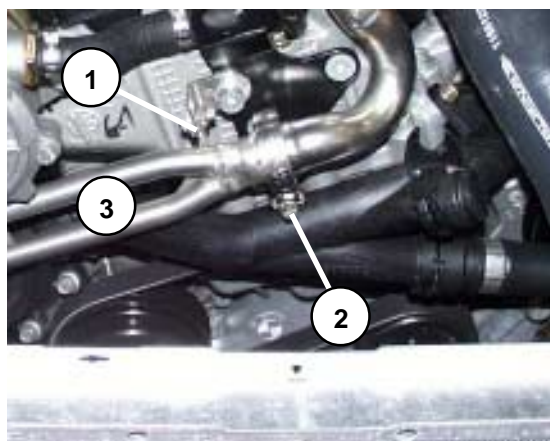


Loosen the clamps (1) on the molded hoses.  
Remove the crankcase-ventilation hose (2).  
Remove the distributor on the air-intake duct complete with the intake duct for turbocharger 1 by pulling it forward.  
Remove the intake duct (3) for turbocharger 2.



Remove the clamp (1).  
Unscrew the fitting for the EGR-line on the rear exhaust manifold and the bolts on the flanged joint (2).  
Remove the rear EGR-line.

Unscrew the fitting for the EGR-line on the front exhaust manifold.



**Vehicles equipped with manual transmissions only:**

Remove the bolt and nut (1) holding the fitting in place.  
Loosen the clamp (2) and remove the front EGR-line (3).



**Vehicles equipped with automatic transmissions only:**

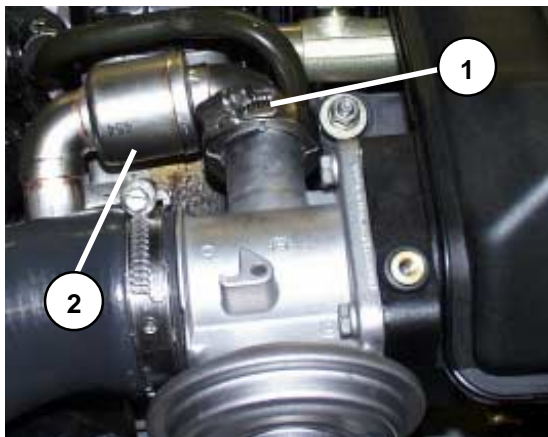
Drain the cooling system.  
Refer to Dwg. No. 17 00 005 for instructions on draining the cooling system.  
Remove all water lines from the EGR-cooler.

Loosen the hose clamps (1) and remove the front EGR-line (2).  
Remove the pair of bolts holding the EGR-cooler in place and remove the EGR-cooler.





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Loosen the clamp (1).  
Remove the EGR-line (2).

**Reinstalling the EGR-lines:**

- Refill the cooling system.
- Check the cooling system for leaks.





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**Removing and reinstalling / replacing the high-pressure fuel pump**

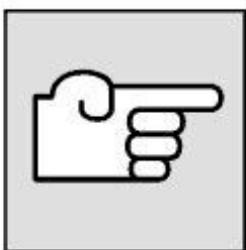
Switch off the ignition.



**Warning!**

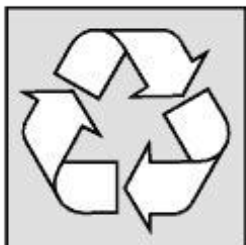
Cover the alternator with plastic foil or other suitable material before undertaking any work on vehicle's oil, cooling, or fuel systems in order to prevent liquids or other contamination entering the alternator.

Failure to do so may lead to an alternator failure.



After removing the fuel-injector lines, seal all openings on the high-pressure fuel pump, fuel distributor and common rail with suitable caps or plugs.

The timing of the pump's operation is arbitrary, since its operation is not synchronized to that of the engine's valve gear.



**Safe disposal of Diesel fuel:**

Catch any Diesel fuel that escapes and dispose of it in accordance with federal, state, and local regulations governing safe disposal of motor fuels.



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Remove the fan cowl.

Refer to Dwg. No. 17 11 031 for instructions on removing and reinstalling the fan cowl.

Remove the intake manifold.

Refer to Dwg. No. 11 61 050 for instructions on removing the intake manifold.

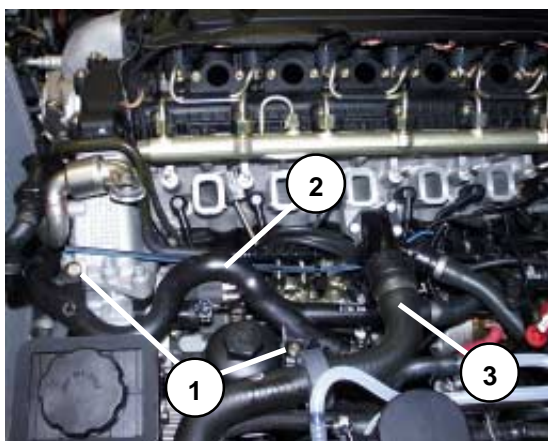


**Caution!**

Do not forget to unplug the connector and remove both vacuum hoses on the transfer valve (1) before removing the intake manifold.

Drain the cooling system.

Refer to Dwg. No. 17 00 005 for instructions on draining the cooling system.



Remove both bolts (1).

Loosen the clamps on each end of the coolant recirculation tube (2) and remove the recirculation tube (2).

Remove the coolant tube (3) on the crankcase housing.

Refer to Dwg. No. 17 00 ... for further instructions on working on the cooling system.

Remove the oil-filter assembly.

Refer to Dwg. No. 11 42 020 for instructions on removing the oil-filter assembly.

**Note:**

The fastening bolt on the forward end of the oil-filter housing is a 6-mm Allen-head bolt.

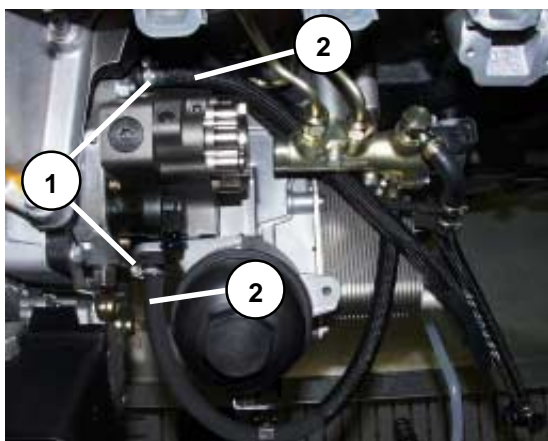
A special wrench (ALPINA 74 00 126) is needed for removing this bolt.



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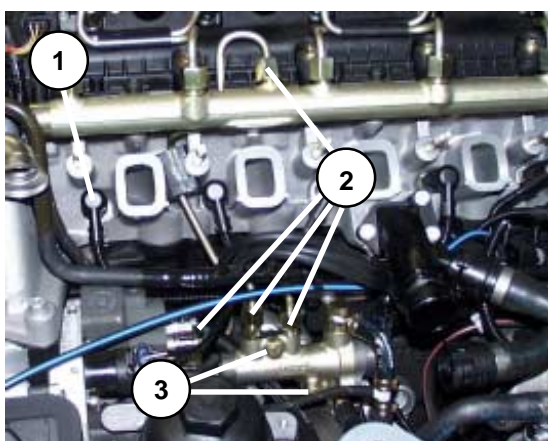


Unplug the connectors (1) on the pump and pressure regulator.



Loosen the clamps (1) on the fuel lines (2).  
Remove the fuel lines (2) from the pump.

**Note on reinstalling the fuel lines:**  
Use new clamps when reinstalling the fuel lines.



Unplug the connector (1) on the glow plug.

Unscrew the union nuts (2) on the fuel lines  
pump - fuel distributor and fuel distributor - rail using the  
special wrench (13 5 020) available for this purpose.  
Remove the fuel line pump - fuel distributor.  
Move the fuel line fuel distributor - rail aside.

Remove the bolts (3) holding the fuel distributor in place  
and remove the fuel distributor.



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Unscrew the nuts (1) on the high-pressure pump.

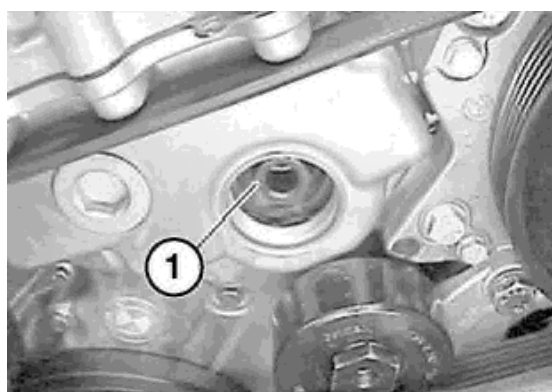


Take the ribbed V-belt driving the alternator off its tensioning pulley.

Unscrew the screw plug (1).

**Note on replacing the screw plug:**

Put a new seal on the plug before replacing it.



Unscrew the nut (1) holding the pump's chain wheel on the pump's shaft.

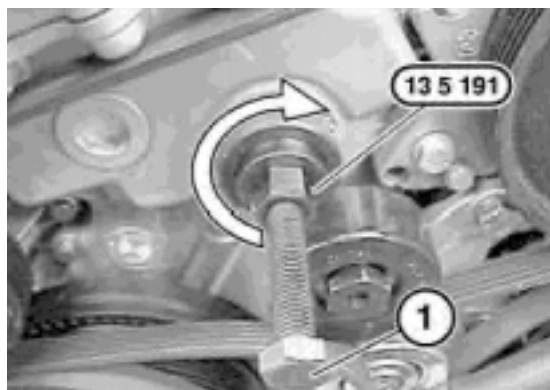


Insert the special tool (13 5 190) into the opening on the gearbox cover while rotating it clockwise.





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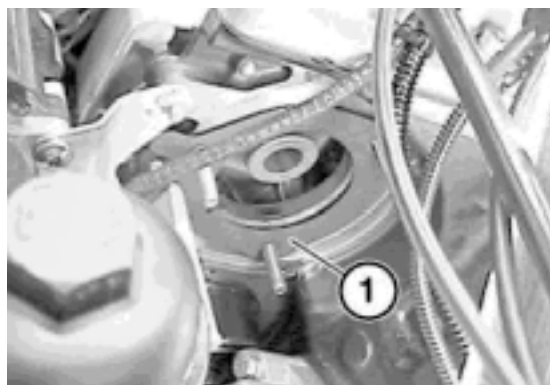
Screw the special tool (13 5 190) into the recess in the high-pressure pump's chain wheel and then screw the other special tool (13 5 191) into the tapped hole in special tool 13 5 190 until its hex nut abuts against the outer face of special tool 13 5 190.



Tighten the bolt (1) until the chain wheel has been driven completely out of its housing.  
Remove the high-pressure pump.

**Caution!**

The special tool (13 5 190) must be left in position in order to hold the high-pressure pump's chain wheel in place. Under no circumstances should it be removed before all other work has been completed.  
Unscrew the bolt (1) before reinstalling the high-pressure pump.



**Notes on reinstalling the high-pressure pump:**

- Use a new gasket (1).
- Make certain that the gasket (1) is correctly oriented.
- All mating surfaces should be perfectly dry and free of grease prior to reassembly.



**Bleeding the fuel system:**

To bleed the fuel system, proceed as follows:  
Pinch off the fuel-return line (1).  
Switch on the ignition and leave it on for about 1 minute.  
Start the engine.  
The fuel system will now be filled with fuel and all air will have been expelled.

Open the fuel-return line (1).

Switch off the engine.





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**Removing and reinstalling / replacing the fuel distributor**

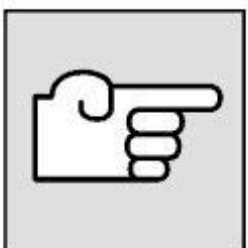
Switch off the ignition.



**Warning!**

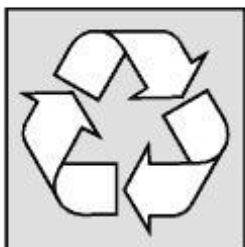
Cover the alternator with plastic foil or other suitable material before undertaking any work on vehicle's oil, cooling, or fuel systems in order to prevent liquids or other contamination entering the alternator.

Failure to do so may lead to an alternator failure.



After removing the fuel-injector lines, seal all openings on the high-pressure fuel pump, fuel distributor and common rail with suitable caps or plugs.

The timing of the pump's operation is arbitrary, since its operation is not synchronized to that of the engine's valve gear.



**Safe disposal of Diesel fuel:**

Catch any Diesel fuel that escapes and dispose of it in accordance with federal, state, and local regulations governing safe disposal of motor fuels.



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Remove the intake manifold.

Refer to Dwg. No. 11 61 050 for instructions on removing the intake manifold.

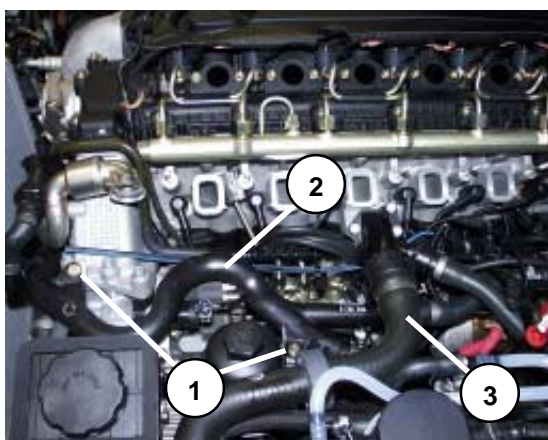


**Caution!**

Do not forget to unplug the connector and remove both vacuum hoses on the transfer valve (1) before removing the intake manifold.

Drain the cooling system.

Refer to Dwg. No. 17 00 005 for instructions on draining the cooling system.



Remove both bolts (1).

Loosen the clamps on each end of the coolant recirculation tube (2) and remove the recirculation tube (2).

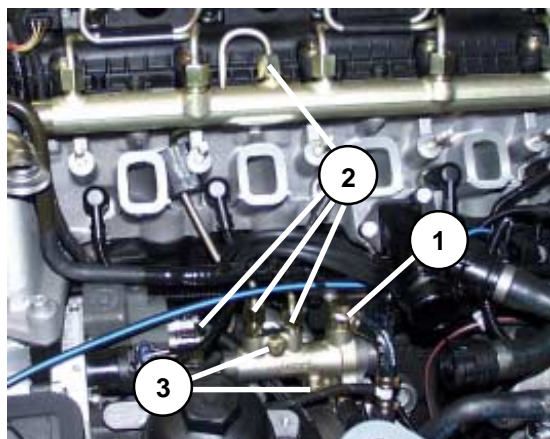
Remove the coolant tube (3) on the crankcase housing. Refer to Dwg. No. 17 00 ... for further instructions on working on the cooling system.



Unplug the connector (1) on the fuel distributor's pressure regulator.



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Unscrew the fitting (1) on the fuel line to the fuel distributor and remove the fuel line (1). Unscrew the union nuts (2) on the fuel lines pump - fuel distributor and fuel distributor - rail using the special wrench (13 5 020) available for this purpose. Remove the fuel line pump - fuel distributor. Move the fuel line to the distributor rail aside.

Remove the bolts (3) holding the fuel distributor in place and remove the fuel distributor.

Remove the fuel line on the underside of the fuel distributor.



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**Removing and reinstalling / replacing the exhaust system as a unit**



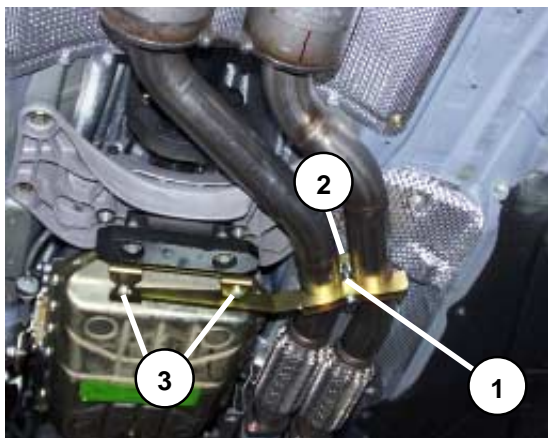
**Warning!**

Burn hazards!

Do not attempt any of the following servicing operations until the vehicle's exhaust system has cooled down.

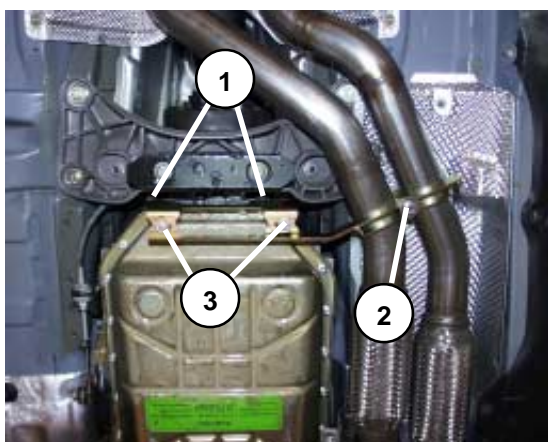
Remove the skid plate.

Support the exhaust system on a hydraulic jack.



Remove the clamping bolt (1) and clamp (2) holding the exhaust pipes.

Unscrew the nuts (3) and slide the mounting bracket off the studs on the rubber buffers.



**Reinstalling the exhaust system:**

Loosen the bolts (1) fastening the mounting bracket to the rear of the transmission housing.

Loosen the nuts (3) on the rubber buffers.

Align the exhaust pipes on the head pipes, insert them into the head pipes, position the mounting bracket on the undersides of the exhaust pipes, slide it onto the studs on the rubber buffers, position the clamp atop the exhaust pipes, insert the clamping bolt (2), make certain that the exhaust pipes and mounting bracket are correctly aligned and unstressed, and then tighten the clamping bolt (2).

Tightening torque: 10 Nm

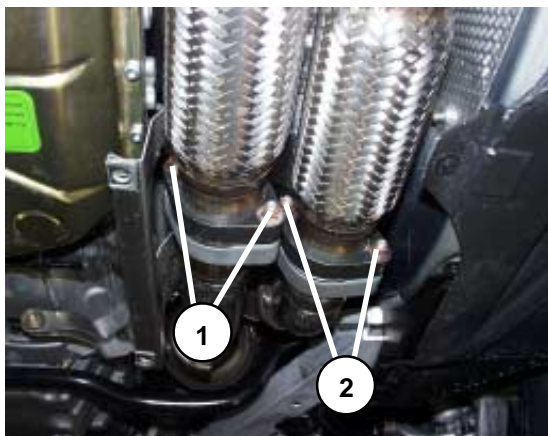
Tighten the nuts (3) on the rubber buffers.

Tighten the bolts (1) fastening the bracket to the rear of the transmission housing.

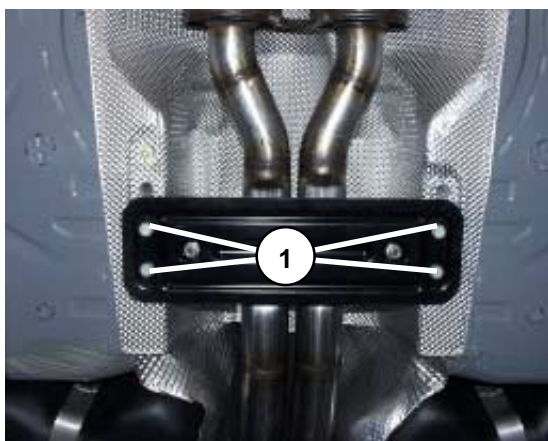




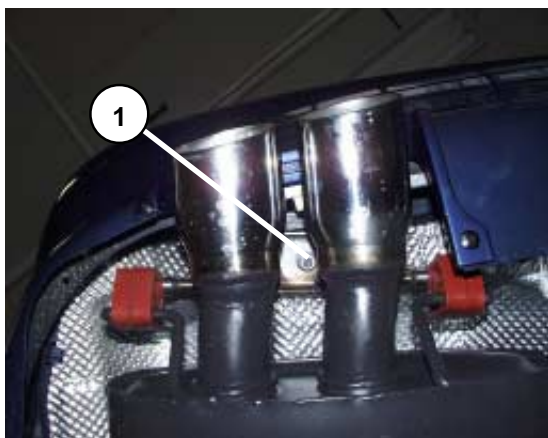
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Remove the four nuts and bolts (1 and 2) from the flanged joints.



Remove the four screws (1) holding the mounting bracket in place.



Remove the screw (1) holding the tailpipe bracket in place and withdraw the exhaust system as a unit.





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**Removing and reinstalling / replacing the precatlyst**



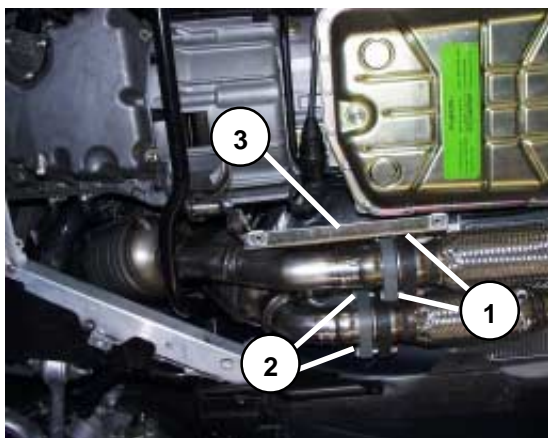
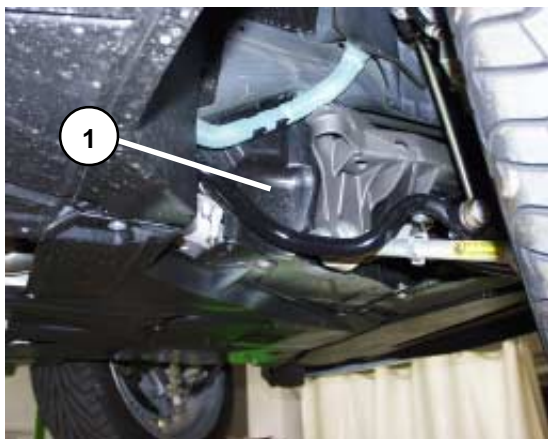
**Warning!**

Burn hazards!

Do not attempt any of the following servicing operations until the vehicle's exhaust system has cooled down.

Remove the skid plate and the engine shrouding.

Remove the domed cover (1).



Remove the nuts and bolts (1 and 2) from the flanged joints.

Withdraw the flexible extensions on the exhaust pipes from the precatlyst.

Remove the mounting bracket (3) for the skid plate.

Remove the nuts on the flanged joints mating the precatlyst to the turbochargers.

**Notes on installing / reinstalling precatlyst:**

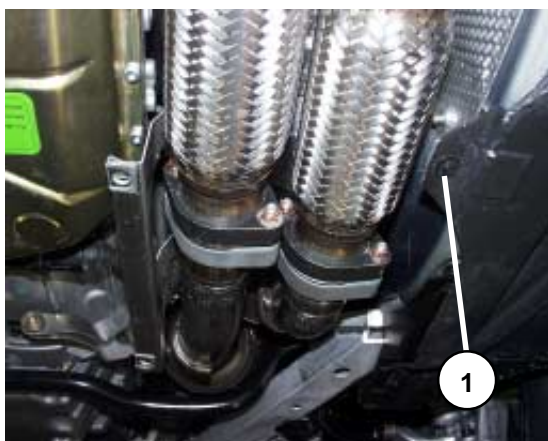
Use all new nuts. Coat the threads on all bolts with a thin layer of copper paste (CRC), which is available from BMW's parts department.



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Remove the nuts and bolts (1) from the mounting brackets and withdraw the precatlysts.



**Notes on installing / reinstalling precatlyst:**

Align the precatlysts such that their mounting brackets lie flat on their supports.

Their pipes should be parallel and both at the same height.

The clearance between the flexible extensions on the exhaust pipes and the bracket (1) should be about 10 mm after they have been inserted into the precatlyzsts.